PERSONAL RADIO STEERING GROUP

P.O. Box 2851
Ann Arbor, Michigan 48106
(313) MOBILE 3 [*Office Phone*]
(313) 995-2100 [*Computer BBS*]

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Amendment of the Commission's Rules	)	WT Docket 95-102
to Establish a Very Short Distance	)	(RM-8499)
Two-Way Voice Radio Service	)	

Reply Comments Filed in Response to a Notice of Proposed Rule Making

Filed by:

Corwin D. Moore, Jr.
Administrative Coordinator
Personal Radio Steering Group, Inc.
PO Box 2851
Ann Arbor, Michigan 48106
(313) 662-4533

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Executive Summary

FRS proponents have failed to justify the amount of spectrum proposed in the *NPRM* for this service. Proposed FRS use of the 462 MHz GMRS spectrum *alone* would be sufficient to satisfy the stated FRS needs. Proposed FRS use of the 467 MHz GMRS spectrum is unnecessary, and would create *extreme risk of interference to and disruption of* operations of licensed GMRS repeaters. Any unlicensed FRS use in the 460 MHz band whatsoever risks revisiting the worst horrors of the disastrous "CB experience." Operation of illegally modified FRS equipment could spill over onto nearby medical and public-safety frequencies, disrupting mission-critical communications.

FRS proponents have failed to identify how the intended users of this allegedly family-oriented radio service will be protected from commercial and industrial users and others that the FCC has previously found are *incompatible* with personal use. The FCC should consider permitting unlicensed, low-power, non-coordinated commercial operations on certain Part 90 frequencies to accommodate these other uses.

The FCC's proposal to ensure rules compliance by building the necessary constraints into the radio hardware *itself* is a correct approach, but needs to be expanded to prevent other identifiable abuses that can be anticipated in an unlicensed, CB-type service. The NPRM doesn't go nearly far enough in suggesting hardware configurations to prevent misuse.

Most commenters recommended abandoning the FRS proposal altogether, and addressing instead the long-standing problems of the GMRS licensing process.

Most commenters also recommend that if the FCC proceeds with the FRS proposal, this service should be located in much higher spectrum available for unlicensed use under Part 15 of the FCC Rules. Alternative spectrum is currently available, and is far more appropriate for the intended purposes of the FRS. Use of this alternative spectrum could also enhance the development and implementation of technologies under consideration for use in other radio services.

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I. Background of the Commenter.

The Personal Radio Steering Group, Inc. (PRSG) is an all-volunteer, not-for-profit corporation established in 1980 by licensees in the General Mobile Radio Service (GMRS, FCC Part 95A) to provide services to and to serve as an advocate for the GMRS personal-use community. The PRSG is the continuation of the GMRS Task Area of the Congressionally-chartered FCC Personal Use Radio Advisory Committee (PURAC, 1976-1978).

The PRSG has published more than 300 different guides to GMRS licensing, technology and operating practices. PRSG's flagship publication, the **GMRS National Repeater Guide**, lists the more than 3,000 GMRS repeaters, their sponsors, technical characteristics and detailed coverage information. The Guide has become the essential reference to this cooperative, nonprofit communications network for licensed private individuals. PRSG also works closely with major land mobile equipment manufacturers to disseminate instructional materials for radio purchasers.

The PRSG tracks GMRS applications and grants. We provide 24-hour on-line access to the national GMRS licensing database of over 35,000 stations, in support of the FCC requirement that all system licensees must cooperate in the selection and use of channels.[1] PRSG staff members and volunteers regularly answer questions about GMRS licensing and usage over the Internet and other national computer networks.

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1 §95.7(a).

II. FRS Proponents Have Failed to Quantify the Need for FRS Allocations.

As pointed out by Troy and Withers,[2] none of the parties that submitted comments to the original *Petition*[3] have *conclusively established* a need for the FRS. The allegation of the existence of "a burgeoning public demand"[4] was made originally by Tandy, and supported by Motorola[5] and others whose obvious motives are to sell radios (or to represent those who sell radios). Nowhere has there been any citation or documentation of how that alleged demand has expressed itself. For instance, there have been

- no reports nor even estimates on sales of existing GMRS radios, nor concrete estimates of anticipated sales of FRS radios.
- no documentation nor even mere allegations of insufficient capacity of the *existing* communications alternatives.
- no expression of support whatsoever from the public about whether this service would be desirable, especially with reference to why specific communications needs are not being currently met, nor (with hardware enhancements and/or updated regulations) could not subsequently be met by existing radio services.

REACT International, a national user-based organization whose members are actively involved in local emergency and public-service activities, is more likely than any manufacturer to be in touch with actual personal and community needs. REACT also reports that such needs exist,[6] but REACT complains that the FRS, as proposed, fails to meet or to respond to those needs.[7]

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2 Comments submitted by Michael F. Troy ("Troy") and Mark D. Withers ("Withers").

3 RM-8499, "In the Matter of Amendment of the Commission's Rules to Establish a New Radio Service," filed by Radio Shack Division, Tandy Corporation ("Tandy") of Fort Worth, TX.

4 *NPRM* at ¶2.

5 Comments filed by Motorola, Inc. to the Tandy Petition, RM-8499.

6 Comments by REACT International ("REACT") filed in response to RM-9499, and in response to this *NPRM*.

7 Comments to this *NPRM* by REACT International at page 6.

Nor have any FRS proponents justified why existing services, possibly with hardware or technology enhancements and lessening of the regulatory burden, could not fulfill those needs, except to complain about the cumbersome nature of the current licensing process.

The obvious solution is: **Fix the GMRS licensing process.** This is discussed in more detail in the Section VI below.

Even those that support the claim of this allegedly "burgeoning public demand"[8] failed to defend the amount of spectrum to be used by the FRS. The *NPRM* states that

> "(e)ach channel would be usable simultaneously by *many millions* of small groups throughout the country." [*Emphasis* added.]
>
> — *NPRM* at ¶8.

If that is true, exactly how many millions of simultaneous communications exchanges need to be provided for? FRS proponents are *totally silent* on this matter. For instance, if it is only "many millions," then merely a *single channel* nationally (by this FCC projection) would be sufficient to meet this *entire* alleged FRS need.

III. FRS Transmissions in the 467 MHz Band Threaten GMRS Repeaters.

The GMRS repeater user community is most concerned about the interference that GMRS repeaters, receiving in the 467 MHz band, would suffer from FRS transmitters also operating in that band. Witte[9] (who holds an advanced degree in Electrical Engineering) predicts "a high probability for adjacent channel interference." [10]

In its *Petition*, in its *Reply* to comments filed to its *Petition*, and now yet again in its *Comments* to this *NPRM*, Tandy has remained *entirely silent* about the potential of FRS transmis-

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8 *NPRM* at ¶2.

9 Comments filed by Robert Witte ("Witte").

10 *Op. cit.* at ¶2.

sions on the 467 MHz interstitial frequencies interfering with GMRS repeaters' reception of signals on the adjacent primary channels.

GMRS repeaters usually employ elevated receive antennas, in order to provide the best possible service for low-power mobile and hand-held radios. This increases repeaters' susceptibility to interference from signals within their receivers' passbands. Tandy's silence pretends to ignore the harmful impact that even low-power 467 MHz FRS transmissions will have on GMRS repeaters.

Tandy's allegations of non-interference, ignoring this repeater susceptibility, are even more devious:

> "Significantly, these prohibitions on external antennae and power amplifiers will help ensure that FRS units will not cause harmful interfere (*sic*) to other users of the 462 MHz interstitial GMRS frequencies. In addition, the line-of-sight propagation characteristics of UHF, the low power of the FRS transmitters (just 500 milliwatts), and the capture effect of FRS's F3E FM emission type will virtually preclude interference with GMRS users of the 462 interstitial channels."
>
> — Tandy *Comments*, pp. 3-4.

This claim pertains only to operations at 462 MHz. Nowhere does Tandy make such claims of non-interference to GMRS repeaters by FRS operations in the 467 MHz band — a threat that concerns the overwhelming majority of commenters in this proceeding.

What clearer indication could the Commission want that Tandy, as Petitioner and now commenter in this proceeding, is unwilling to claim, or at least is apprehensive about claiming, that FRS radios transmitting in the 467 MHz band will cause *no* interference to GMRS repeater receivers. This exposes Tandy's claim of "no discernable (*sic*) impact on present radio users"[11] as being *wholly unsupported*.

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11 Tandy's *Comments*, p. 2.

And if Tandy's FRS radios *do* cause interference to GMRS repeaters, how will Tandy respond?

> "The radios passed certification."
> "Interference complaints should be taken to CIB."
> "It's beyond our control."
> "It's due to poor receiver design of the repeaters."
> "The FRS radios are being operated out of tolerance."

We must assume that Tandy, as the originator and an active participant in this proceeding, has read the multitude of comments to its *Petition* that warned of FRS interference to GMRS repeaters. Tandy must surely recognize the extreme and well-founded concern that the GMRS repeater community has. But *nowhere* in its *Comments* has Tandy chosen to address these concerns, apparently preferring to "stonewall" them hopefully out of existence.

Other communications industry entities supportive of the FRS proposal have at least been more forthright about the potential FRS interference to GMRS repeaters. Motorola[12] has explained in detail what it believes will be necessary to restrict the FRS bandwidth to just 12.5 KHz, by means of limiting audio bandwidth and deviation level. However, even though Motorola discusses the need for ±0.00025% frequency stability, its calculations of bandwidth *alone* fail to recognize the additional ±1.1625 KHz (or a total of 2.325 KHz) of frequency excursion. The size of the *envelope* within which the FRS signal can exist, assuming the limits in deviation, audio sideband and frequency stability proposed by Motorola, is still 13.575 KHz, more than half of the conventional full-channel spacing. FRS signals complying with even these tighter technical standards are most certain to intrude into the passbands of conventional GMRS repeater receivers.

Other industry sources concur about the potential FRS interference to GMRS repeaters. Comments from the Telecommunications Industry Association[13] state that it

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12 Comments filed by Motorola, Inc. ("Motorola") at pp. 7-9.

13 The Mobile and Personal Communications Private Radio Section of the Telecommunications Industry Association ("TIA/Mobile").

> "takes no position on the proposed technical standards contained in the Notice other than to remind the Commission of the need to ensure protection to adjacent channel GMRS operations to the fullest extent possible. TIA is confident that with direct input from participating manufacturers, the FCC will be able to craft rules that . . . protect GMRS . . . ."
>
> — TIA/Mobile at p. 2.

Notably, Tandy has made no such *constructive* comments or recommendations on the technical standards. However, in comments filed to the *Notice of Proposed Rulemaking* in Docket PR 87-265, TIA/Mobile's predecessor stated:

> "Modulation products of such transmitters (on the interstitial frequencies) might be expected to produce interference to primary channel operation . . . ."
>
> — Electronic Industries Association, Personal Communications Section, as quoted in the Report and Order, PR Docket 87-265 at ¶61.

In the *Report & Order* of that same docket (PR 87-265), the FCC reported that

> "EIA-Land Mobile[14] concurred and advanced calculations in support of the proposition that splatter interference from the proposed offset operations *would substantially reduce* the usable service area of GMRS stations." [*Emphasis* added.]
>
> — R&O, PR 87-265 at ¶61.

Man-made laws change, but the laws of physics are somewhat more immutable. If transmissions on the interstitial frequencies caused splatter in 1987, similar transmissions today would still cause splatter. For repeaters and their elevated receiver antennas, FRS transmissions in the 467 MHz band *will* cause interference.

This potential for interference, as warned by EIA-Land Mobile and TIA/Mobile, is also recognized by Motorola in its recommendations[15] to tighten the frequency stability and to decrease the maximum permissible deviation on FRS transmitters. Accordingly, the technical standards proposed in the *NPRM* must be modified.

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14 Electronic Industries Association, Land Mobile Radio Section ("EIA-Land Mobile").

15 Comments to *NPRM* in WT Docket 95-102 at pp. 7-9.

Uniden apparently disagrees when it predicts:

> "There will undoubtedly be those who *conjure some scenario* to demonstrate that there would be some increase in the *potential* for interference to GMRS by the proposed FRS." [*Emphasis* added.]
>
> — Uniden *Comments* at ¶5.

Uniden apparently wishes to characterize as "conjurers" those who express serious concern about the interference potential from FRS transmissions in the 467 MHz band to local GMRS repeaters. Apparently Uniden has a low regard for the competence of Motorola engineers.

In this instance, we consider Motorola's concerns to be valid. At least Motorola recognized, and Uniden did not, that the technical standards proposed in the *NPRM* for the FRS are inherently inconsistent, and that a 12.5 KHz bandwidth cannot be achieved when employing a ±5 KHz deviation.

Cobra doubts[16] that the proposed 12.5 KHz bandwidth can be accomplished at reasonable cost, but goes on to argue that such a restricted bandwidth is not necessary because of the limited transmitter output power. This reveals Cobra's apparent misconception that interference is caused primarily by transmitter power, and not antenna height.[17]

PRSG believes that the *total* FRS emission envelope *including* the space needed for excursion for frequency stability should be limited to not more than **12.5 KHz**. For instance, if the deviation were limited to a maximum of ±2.0 KHz, if the audio modulation and sideband were limited to a maximum of ±3.0 KHz, and if the frequency stability were held to ±0.00025% (or ±1.1625 KHz), then the total envelope dimension would be 12.325 KHz. We believe this to be a realistically achievable standard.

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16 Comments to the *NPRM* in WT Docket 95-102 filed by Cobra Electronics Corporation ("Cobra") at p. 2.

17 We note here that Cobra claims no demonstrable competence or engineering experience with UHF-FM transceivers — its primary qualification in this docket is as a manufacturer of *consumer-grade* CB radios.

IV. FRS Should Be Limited Just to the 462 MHz Spectrum.

Several commenters (for instance, Boakes, Feit, McKenna and Tumser[18]) have suggested that lacking an established and well documented need for greater capacity, the FRS could achieve an adequate *initial* implementation by using only the 462 MHz GMRS interstitial channels (designated channels 1 through 7 in the proposed §95.627(a)). Feit proposes permitting FRS use of only every *other* interstitial frequency.

Tumser and McKenna propose declining to allocate *any* of the proposed 467 MHz frequencies (designated channels 8 through 14 in the proposed §95.627(a)) pending a subsequent "needs analysis" or evaluation of compatibility with GMRS operations. Even then, McKenna recommends permitting FRS operations only with a 6.25 KHz bandwidth, in order to achieve a higher initial system capacity and to encourage development of more spectrum-efficient technology. McKenna encourages withholding the authorization of *any* 467 MHz spectrum to the FRS until GMRS repeater licensees have had sufficient time to convert their stations to narrower band, more spectrum-efficient technologies.

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18 Comments filed by Edward W. Boakes ("Boakes"), Susan L. Feit ("Feit"), Michael T. McKenna ("McKenna"), Farrington R. Tumser III ("Tumser").

If FRS is to be implemented in existing GMRS spectrum, the PRSG supports this concept of allocating *only* the 462 MHz frequencies initially, pending these subsequent evaluations. FRS use of the proposed 462 MHz frequencies would be decidedly less disruptive to GMRS users, and *profoundly* less likely to cause interference to GMRS repeater operations, than FRS use of the proposed 467 MHz frequencies, for reasons discussed by numerous commenters.[19]

This would also avoid the inevitable problem of interference resolution in the 467 MHz band. In the 462 MHz band, users of the interstitial frequencies (whether GMRS licensees or FRS users), upon detection of interference from an adjacent *primary* GMRS channel, can change channels to seek one with less interference. In the 467 MHz band, repeaters are on *assigned* 467 MHz channels, and they do not have the capability of switching to another channel. The parties *causing* interference to GMRS repeater receivers by transmitting on the proposed FRS 467 MHz interstitial frequencies are likely neither to be aware of the interference, nor to be inclined to change to other channels where such interference would be eliminated or substantially reduced.

Allocating only the seven 462 MHz GMRS interstitial frequencies for initial FRS use would still accommodate the needs, according to the *NPRM*, of seven times "many millions of small groups throughout the country."[20] No commenter, not even the most enthusiastic FRS supporter, has projected a need for any greater capacity than that for the FRS.

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19 See comments previously listed filed by Boakes, Feit, Troy, Withers and Witte; plus comments filed by individual persons Isadore Betz ("Betz"), Gordon M. Brown ("Brown"), Ernest R. Cameron ("Cameron"), Kerry D. Cochran ("Cochran"), Kenneth J. Collier ("Collier"), Francis E. Dutrow ("Dutrow"), Clifford L. Flaharty ("Flaharty"), Teri Forrester ("Forrester"), Cheryl Frair ("Frair"), R.E. Howe ("R.E. Howe"), Ron Howe ("Ron Howe"), Marcella Jacks ("Jacks"), David Kipp MD ("Kipp"), William Lawton ("Lawton"), Bob Leef ("Leef"), Roger Love ("Love"), Charles Masterson ("Masterson"), Terry T. Meier ("Meier"), Ed and Kay Neil ("Neil"), Beth Pearce ("Pearce"), Pam Riechel ("P. Reichel"), Robert M. Riechel ("R. Reichel"), James P. Robeson ("Robeson"), Alton Silver ("Silver"), Robin Smith ("Smith"), Arthur Sylvia ("Sylvia"), Michael T. Tudor ("Tudor"), Walter J. Weiss ("Weiss"), Al Wiel ("Wiel"); plus comments filed by organizations Catocton Communications Club ("Catocton"), Douglas County REACT ("Douglas County").

20 *NPRM* at ¶8.

V. Commenters Question the Need for Yet Another Family-Oriented Radio Service.

Numerous parties commenting on the *NPRM* pointed out that the GMRS already *is* a *family*-oriented radio service.[21] When the FCC changed the licensing eligibility in the GMRS in 1987, the FCC explained at length its finding that GMRS personal and family communications needed to be protected from uses and users more appropriate for other comparable radio services.

> "We seek to discourage the proliferation of what are typically Part 90 uses of the GMRS. The GMRS is not and should not become the 'other' Business Radio Service."
>
> — *Report & Order*, PR Docket 87-265, October 13, 1988 at ¶16.

These protections for GMRS personal and family users were implemented by means of the *licensing process*.

The manufacturers and retailers (especially Tandy, Motorola, and Uniden) that now question the need for the "regulatory oversight" inherent to the licensing process are, not coincidentally, the very same manufacturers and retailers that are now extensively involved in sales of GMRS radios to the business and commercial-use community. These are the kind of users that the Commission earlier found should operate in services and spectrum *other than* the GMRS. These manufacturers' and retailers' support must be viewed as a *bald-faced attempt* to *circumvent* the protections that the FCC previously found were necessary for personal and family-oriented communications in the GMRS.

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21 For instance, see comments previously listed filed by Boakes, Collier, Feit, Kipp, R. Riechel, Robeson, Silver, Smith, Troy, Tumser, Withers and Witte; plus comments filed by individual persons Alan C. Frensley ("Frensley", James R. Haskett ("Haskett"), James A. Morris ("Morris"), and W.F. and J.A. Simpson (also commenting on behalf of the Wisconsin Council of REACT Teams) ("Simpson"); plus comments filed by the organization Greater Anchorage REACT Inc. ("Anchorage").

V.1. FRS Supporters Fail to Propose Protections from Incompatible Uses and Users.

The *NPRM* is completely silent on how the FRS, an allegedly new *family* radio service but actually using spectrum currently allocated to the GMRS, would be protected from the kind of abuse and overuse that afflicted the GMRS, and that caused the FCC to change the licensing eligibility standards in the GMRS. By implication, the *only* dissuasion from this inappropriate use that the *NPRM* provides would be merely by the *name* of the radio service itself. Commenters supporting the creation of the FRS out of GMRS spectrum were nearly entirely *silent* on the issue of how to keep this supposedly *family* oriented radio service from being overrun by business and commercial users.

Boakes proposed[22] that manufacturers be required to affix a label on each FRS transceiver stating

> "This radio is for personal and family communications only. It is unlawful to use the radio as part of a business or as part of a job."

PRSG supports the general concept of labeling with user-friendly instructions and guidelines, but cautions that this is *no panacea*. Labeling should not replace requiring hardware constraints intended to encourage rules compliance.

Labeling may have an only negligible impact on how FRS radios are purchased and used. Commercial or business-user purchasing decisions are not likely to change unless there are similar *unlicensed* communications capabilities at *comparable costs* available for those whose intention *is* to conduct business communications to support the activities or goals of third-party entities. Besides, prohibiting "business" communications suggests that only recreational or hobby communications *are* permitted. That would be a radical *misdirection* for use of the GMRS spectrum.

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22 Boakes at p. 1.

Proposals to require FRS labeling directing operators not to use the radios for business communications risk a semantic problem. The GMRS can be characterized as appropriate to use for the conduct of licensees' personal *business*, or to support the *business* of the contemporary, mobile American family. GMRS is a *functional* radio service, not a *recreational* radio service like CB Radio or Amateur Radio. GMRS is an *inappropriate* radio service for communications whose primary purpose is merely to engage in the act of communicating or as an act of recreational diversion. GMRS is used primarily to support the communications necessary for the actual plans and activities of the licensee and his or her family. GMRS has *not* degenerated, as did CB long ago, into the kind of "recreational" radio service used solely for chit-chat and entertainment. The GMRS has largely retained the purpose for which it was created back in 1948.

Indeed, many of GMRS' currently licensees have migrated to this service specifically to escape the banalities and the vulgarities that have come to afflict CB. Many GMRS users are "refugees from eleven meters," and as this proceeding abundantly demonstrates, they will jealously guard this public resource from the misuse and abuse that have so notoriously come to characterize CB Radio.

This discipline and civility clearly distinguishes GMRS from Citizens Band Radio, which the FCC (despite Congressional directives to the contrary[23]) has allowed to deteriorate into a hobby-type service, a surrogate form of Amateur Radio.

Prohibiting undefined or ambiguously defined "business" communications would be a step backward for users of the GMRS spectrum. It is not the *business* of the individual licensee, nor the *business* of the family user, that should be restricted. Instead, it is the use of the limited GMRS spectrum to support the *business* of entities more appropriately licensed or authorized in other comparable private land mobile radio services dedicated to providing such business communications that should be restricted.

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23 See PRSG Comments to this *NPRM* at p 16.

The PRSG would therefore *oppose* requiring the affixing of any label that would suggest that otherwise *undefined* "business" communications are prohibited. Instead, we believe that compliance should be built into the hardware itself. To discourage hobby and chit-chat communications, for instance, transmitter time-out timers should be required, as discussed in a later section on additional hardware and technology constraints.

Feit has proposed an interesting alternative.[24] On the basis of current widespread use of the GMRS interstitial frequencies by unlicensed and ineligible business users (an allegation also confirmed by PRSG experience and by other GMRS users), Feit expects that the FRS will be overrun by such entities as well. Feit therefore proposes to create the FRS out of spectrum now allocated to some of the Part 90 services.

PRSG concurs. Clearly, Part 90 needs to be amended to provide for low-power, uncoordinated, *unlicensed* use on specific Private Land Mobile Radio service frequencies.

V.2. FRS Opponents Decry the Lack of Protection from Inappropriate Uses and Users.

FRS proponents may have been silent on this issue, but GMRS personal/family-use proponents and *NPRM* opponents were not at all silent on how to protect the FRS from usurpation by uses and users more appropriate for other radio services.

Current GMRS users were especially vigorous in reminding the Commission of the negative experience of mixing licensed and unlicensed operations, for instance in the 27 MHz spectrum when CB radio was still licensed.[25] Many objected to the FRS as proposed specifically because

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24 Feit at p. 3.

25 For instance, see comments previously listed filed by Betz, Brown, Catocton, Cochran, Douglas County, Dutrow, Feit, Flaharty, Forrester, Haskett, Kipp, Leef, Love, Meier, Neil, REACT, P. Riechel, R. Riechel, Robeson, Silver, Simpson, Smith, Tudor, Tumser, Weiss, Wiel, Withers and Witte; plus comments filed by individual persons William M. Chin ("Chin"), Roger R. Conway ("Conway"), Donald M. Dineen ("Dineen") and Wendell Helfrick ("Helfrick").

of the *NPRM*'s failure to identify how the FRS would be protected from those whom the Commission has previously determined[26] are incompatible with personal and family use.

Many FRS opponents specifically warned that not just the FRS but the GMRS as well would inevitably disintegrate after an influx of unlicensed users bring their poor CB operating habits with them to the UHF spectrum.[27]

Kobb[28] reminded that the Communications Act permits the FCC

> "to recruit, train, accept and employ the voluntary and uncompensated services of CB operators in the detection of improper CB transmissions; conveyance of compliance information to the Commission; and issuance of advisory notices to apparent violators.
>
> "All of these provisions apply to the FRS as a CB Service. The Commission should work with the personal wireless user community to establish an effective FRS compliance aid program as provided for in the Act."
>
> — Kobb at p. 4.

Numerous commenters[29] strongly objected to the *NPRM*'s failure to propose that FRS operations should be *secondary* to GMRS. PRSG agrees with this sentiment, but again cautions that although this primary/secondary relationship *must* be legally established, it *alone* is not a panacea for all GMRS/FRS conflicts.

TIA/Mobile and other FRS supporters believe that the intermittent and itinerant nature of FRS operations would minimize interference to GMRS.[30] Perhaps just the *opposite* could be true, when compared to use of the "offset" frequencies in the Part 90 bands. Namely, use of the Part

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26 See in general, *Report & Order*, PR Docket 87-265.

27 For instance, see comments previously listed filed by Betz, Brown, Chin, Cochran, Collier, Conway, Dineen, Douglas County, Dutrow, Flaharty, Forrester, Frair, Haskett, R.E. Howe, Ron Howe, Jacks, Kipp, Lawton, Leef, Masterson, Meier, Neil, Pearce, R. Riechel, Silver, Simpson, Smith, Sylvia, Troy, Tudor, Tumser and Weiss; plus comments filed by individual persons Robert O. Baker Sr. ("Baker"), Stephen G. Berk ("Berk") and David J. Sulltrop (in a letter sent directly to FCC Chairman Reid Hundt ("Sulltrop").

28 Comments filed by Bennett Z. Kobb ("Kobb").

29 See comments filed by Betz, Brown, Catocton, Cochran, Dutrow, Flaharty, Kipp, Kobb, Lawton and R. Riechel.

30 For example, see TIA/Mobile at p. 2.

90 offset frequencies is specifically licensed and carefully coordinated specifically to minimize such interference.

On the other hand, no provision for licensing, coordination, or even tracking the basic existence of unlicensed FRS operations would be available, and unlicensed FRS users cannot realistically be expected to understand nor to be willing to cooperate with requests to change their operating locations or frequencies merely because they are told they are causing interference to others.

Some FRS opponents[31] point out that FRS will jeopardize vital public-service and public-safety communications conducted by volunteer organizations using GMRS for their administrative and organizational communications. REACT International cautions that

> "(M)any public service organizations have fled from the CB Radio Service simply because it is impossible to operate a town watch, provide radio communications in a disaster, or to call for emergency response personnel in a radio environment where great numbers of untrained operators seek to utilize a limited number of radio channels. It is precisely because of *licensing requirements* that the GMRS provides a more ordered environment that allows for community service. Elimination of licensing and allowing for a mass market appeal of GMRS equipment would render the service *all but useless.*" [*Emphasis* added.]
>
> — Comments by REACT at p. 6.

Some[32] also remind the Commission that the history of out-of-band operations by CBers in and near the unlicensed 27 MHz CB band could be repeated in the 450-470 MHz band as well, with *dire consequences* for vital Part 90 police and other public safety operations. Such abuse by unlicensed stations would not *diminish* the need for regulatory oversight,[33] but instead could *dramatically increase* the demand on already limited Commission resources.

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31 See comments by Berk, Brown, Chin, Collier and Conway.

32 See comments filed by Berk, Brown, Chin, Collier, Silver, Sulltrop and Tumser.

33 The *NPRM* repeats earlier claims that an *unlicensed* FRS would minimize the need for Commission regulatory oversight. See the *NPRM* at ¶6. PRSG believes that creating another unlicensed, CB-type service could instead have quite the opposite effect. FRS, like the CB Radio Service before it, could become another explosively and embarrassingly unmanageable *pariah*.

Spacelabs Medical Inc.[34] has a particular concern about the interference that the proliferation of 460 MHz-band transmitters could cause to sensitive, low-power ECG and other telemetry and monitoring devices used in large medical centers. However, many of these centers are already saturated with high-power paging signals, many of which signals are actually closer in frequency to the critical medical telemetry signals than those proposed for the FRS.

PRSG believes that the appropriate solution is not to prohibit the use of certain proposed FRS frequencies on this basis alone, but to include warning labels with all FRS transmitters that caution about the use of *any* UHF transmitters in hospital settings. On-site warnings should also be displayed.

PRSG believes the greater danger to medical telemetry devices will come from FRS transmitters being illegally modified, just as CB transmitters at 27 MHz have been modified, to seek supposedly "quiet" or "private" out-of-band channels. Such modifications could place FRS transmitters directly *on* these telemetry frequencies.

FRS rules must require hardware designs that inhibit such modification.

VI. Commenters Encourage the FCC to Fix the GMRS Licensing Process.

Numerous parties[35] have recommended that the FCC simplify the GMRS licensing process as an alternative to overlaying the FRS on top of GMRS spectrum. They argued that the present GMRS licensing process is burdensome.

Witte[36] suggests perhaps a no-fee license. Love[37] suggests a single, lifetime *user license* that would come with the radio, pre-paid by the manufacturer as a form of *point-of-sale licensing*,

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34 Comments filed by Spacelabs Medical Inc. ("Spacelabs") at pp. 5-6.

35 See for example, comments filed by Collier, Kipp, Meier, Robeson, Silver, TIA/Mobile, Tumser and Withers.

36 Comments filed by Witte at p. 3.

37 Comments filed by Love at p. 3.

while retaining the current licensing structure for repeater stations. Love also suggests that repeater coordinating, possibly incorporating certain limitations on transmitter power and antenna height, are needed for GMRS.

PRSG concurs with Love's recommendation about repeater coordinating and limitations, and points out that a voluntary coordinating function is *already* operational in many areas. Further consideration of specific coordinating requirements, including reductions of communications coverage in major urban areas, must however await another docket specifically focusing on needed changes in the GMRS Rules.

REACT International[38] recommends a multi-tiered licensing approach, with a modest user fee ($2 to $5 per year) and a somewhat higher (perhaps $10 per year) fee for repeater stations. PRSG feels this recommendation is meritorious, and should be the subject of a rulemaking addressing specifically the licensing problems and opportunities for the GMRS.

Fixing the licensing process is precisely what the PRSG, as the national advocacy organization for personal licensees in the GMRS, has repeatedly requested the FCC to do. We have made several presentations to FCC staff, both to those in Washington, DC and to those at the FCC's Gettysburg, PA licensing facility, about the need for simplifying the licensing process. PRSG even proposed a specific form to replace the existing FCC Form 574.

To date, the FCC has taken no action to implement, or even to propose implementing, this simplified licensing application for GMRS.

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38 Comments filed by REACT at pp. 10-11.

VII. Commenters Raised Technical Concerns About the *NPRM*.

Several commenters found technical aspects about the *NPRM* to be contradictory or ambiguous. In addition, some FRS supporters seem not to understand basic laws of physics.

VII.1. There is Confusion About the Impacts of Power Versus Height on Communications Range.

Several commenters[39] joined the PRSG in pointing out that antenna height is the primary determinant of communications range, and thus of interference potential between stations. Transmitter output power is only of secondary importance. Attempting to limit communications range or interference potential *solely* by limiting transmitter output power merely repeats the folly of 27 MHz, when the FCC attempted to limit communications range merely by limiting transmitter power.

In its comments, Tandy[40] continues to fail to recognize this important truth, as does Cobra.[41] Both continue in their mistaken belief that limiting transmitting power alone can significantly reduce the potential for interference to GMRS operations.

Tandy and others continue also in their mistaken belief that the "FM capture effect" will benefit the station with the more powerful transmitter. The infamous "FM capture effect" has nothing to do with *transmitter power*. Instead, it concerns the relative strengths of two or more signals at the *receiver*. At 460 MHz frequencies, the strongest received signal usually depends more on the *relative heights* of the transmit antennas, than on the actual transmitter output powers.

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39 See comments filed by Anchorage, Frensley, Kipp and Smith.

40 Comments by Tandy, in general.

41 Comments by Cobra at p. 2.

By failing to recognize these two realities (that limiting power does not necessarily limit range, and that antenna *height* is more important than transmitter *power*), neither Tandy nor Cobra comprehend that FRS transmitters *will* significantly interfere with GMRS operations.

VII.2. There is Confusion About Repeater Transmitting Versus Receiving Frequencies.

Several commenters[42] observed that the *NPRM*[43] confuses repeater *transmitting* and repeater *receiving* frequencies. The Commission is confused about this distinction, but must realize the extreme jeopardy to which the 467 MHz GMRS *primary* channels would be subject to interference if FRS transmissions are permitted on the 467 MHz *interstitial* channels.

VII.3. There is Confusion About Bandwidth and Spectrum Envelopes.

Several commenters[44] pointed out that the FRS could not employ a ±5 KHz deviation and still remain within a 12.5 KHz envelope. Maxon made an *ex parte* presentation to Commission staff about this inconsistency.

However, few parties recognized that the occupied or potential spectral envelope must also consider *frequency stability*. A tightly limited bandwidth with an overly loose stability would be complete folly. Discussion of bandwidth must *always* consider as well the context of where that envelope resides, and within what range it fluctuates relative to users of the adjacent spectrum.

Motorola[45] and North Shore Emergency Association[46] proposed that FRS emissions be permitted a frequency stability of only 0.00025% (2.5 parts/million). At 465 MHz, that would

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42 See comments previously listed by Anchorage and Smith, and comments filed by William T. Campbell ("Campbell").

43 At ¶4.

44 See comments filed by Anchorage at p. 3, Motorola at pp. 7-9, Simpson at p. 2, Smith at p. 2, and Troy at p. 3, as well as PRSG at pp. 3-4.

45 Comments filed by Motorola at p. 9.

46 Comments filed by North Shore Emergency Association ("NSEA").

still permit a permissible excursion of ±1.1625 KHz, or a total of 2.325 KHz. The amount has to be added to the more conventionally defined bandwidth (twice the deviation plus twice the audio subband [the maximum audio frequency response]) to reflect the total size of the spectrum envelope within which the signal will exist.

PRSG supports Motorola's observation [Motorola at pp. 7-8] that additional restrictions are necessary to minimize interference with licensed GMRS operations. However, Motorola's total calculated bandwidth (11.25 KHz) does not include the additional envelope size necessary to accommodate frequency stability (2.325 KHz with a 2.5 parts per million stability). When stability is added, the total envelope size, with permissible excursion, comes to 13.575 KHz, in excess of the 12.5 KHz half-channel spacing at GMRS.

McKenna[47] proposes limiting the FRS bandwidth to only 6.25 KHz, a level proposed for eventual implementation in the Part 90 services. He believes that establishing this tighter operating performance initially will encourage the communications industry to develop the appropriate super-narrow-band technology sooner. McKenna also proposes to disallow FRS operation, even with this 6.25 KHz bandwidth, in the 467 MHz band until GMRS licensees have been given adequate time to convert to new, more spectrum-efficient radios.

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47 Comments filed by McKenna at p. 1.

VIII. Most Commenters Supported Prohibiting Interconnection With the Public Switched Telephone Network.

Most parties[48] addressing the issue of interconnection recommended that it be prohibited in the FRS. Pacific Bell pointed out that interconnection presupposed operation from a base station, but that no provision for FRS base stations was included in the *NPRM*. PRSG also opposed interconnection, but we point out that with the proliferation of cellular telephones, PSTN interconnection is no longer the sole domain of the land-based wireline telephone system. We believe that interconnection between FRS transmitters and mobile cellular telephone instruments should also be prohibited.

PSTN interconnection is *not*, as Pacific Bell stated[49] solely "an attribute of a commercial mobile radio service (Part 20)." Indeed, interconnection is widely used in other radio services, and is even permitted in the 27 MHz Citizens Band Radio Service. However, we oppose the extension of interconnect from 27 MHz CB to FRS.

In our Reply Comments to the *NPRM* in PR Docket 87-265, we asked that the FCC consider permitting a unique and exclusive exemption to the prohibition of PSTN interconnection, in order to link GMRS base or repeater stations to the nearest public safety answering points (PSAPs). The *Report and Order* in this docket declined to adopt such an exemption. We believe that consideration of this exemption should be revisited at some point, but *only* for licensed GMRS stations. Providing PSTN interconnection to the local PSAPs would be extremely difficult to control in an unlicensed and substantially uncontrollable FRS service.

PRSG thus concurs in part with the recommendation by the National Emergency Number Association[50] that any interconnection to the PSTN permit direct access to the local PSAP. We

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48 See comments previously listed by Boakes, Cobra, Simpson, Uniden and Tumser; plus comments filed by ALLTEL Mobile Communications Inc. ("ALLTEL") and Pacific Bell Mobile Services ("Pacific Bell".)

49 Comments by Pacific Bell at p. 2.

differ in that we would want to see such interconnection permitted *only* for licensed GMRS stations, not for unlicensed FRS stations.

IX. Commenters Support Additional Hardware and Technology Constraints for FRS.

The FCC has proposed

> "to regulate the usage of FRS units through technical standards and type certification."
>
> — *NPRM* at ¶9.

The PRSG and numerous commenters[51] strongly agree that regulatory and operational constraints must be built into the hardware itself. The *NPRM* proposes some constraints, and some commenters suggested additional ones.

PRSG recommended that an Automatic Transmitter Identification Code (ATIC) unique to each FRS transmitter should be required. [52] Anchorage[53] also recommends consideration of this concept.

PRSG recommended that FRS use of CTCSS and DCS encoding should be *prohibited* on all 467 MHz frequencies. The overlapping nature of the primary and interstitial channels could result in FRS transmissions causing the improper and unauthorized activation of GMRS repeaters. Other parties[54] made similar recommendations, and some reported on actual field testing that demonstrated that CTCSS use of adjacent 467 MHz interstitial frequencies could be a serious problem.

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50 Comments filed by the National Emergency Number Association ("NENA").

51 For instance, Kobb at p. 1.

52 See PRSG comments at p. 7.

53 Comments of Anchorage at p. 2.

54 See, for example, comments by Kipp, Meier, Robeson, Silver and Simpson.